# LINK

**The Newsletter of the Great Lakes Regional Pollution Prevention Roundtable (GLRPPR)**

**summer 2007 volume 13 number 3**

## In This Issue



## A PRESCRIPTION FOR TROUBLED WATERS: IMPROPER DISPOSAL OF UNWANTED MEDICINES

Just by watching TV commercials, you can tell we are a society that takes a lot of drugs. You see ads for anti-depressants, antacids, and a host of other remedies for ailments. But, what happens to all the prescription or over-the-counter drugs that are brought home, but for one reason or another, end up unused?

"Many thousands of tons of pharmaceuticals are discarded annually in this country," said Beth Hinchey Malloy, Illinois-Indiana Sea Grant (IISG) ecosystem specialist. "If flushed down the toilet or drain, these medicines are a source of pollution in wastewater because treatment plants are not designed to treat or remove these chemicals. They can be released into streams, lakes, and groundwater, posing a threat to aquatic wildlife." In 2000, the U.S. Geological Survey found one or more organic wastewater contaminants (which include pharmaceuticals) in 80 percent of the 139 streams sampled in 30 states[1].

On the other hand, disposing of unwanted medicines in the trash presents safety concerns. "If thrown in the trash, medicines pose a risk of poisoning from accidental ingestion, particularly among young children and pets," said Hinchey Malloy. Illegal use or theft, including identity theft, is also a risk. From an environmental standpoint, pharmaceutical chemicals that end up in landfills can still enter streams, rivers, and lakes when water that leaches from landfills is pumped to wastewater treatment facilities.

*In Chicago, collections of unwanted and expired medicines were collected at 25 sites across the city in May 2006. Chicago police officers and volunteers (shown here) collected over 1,600 pounds of medicines, which were later safely incinerated by the Chicago police. (photo credit Susan Boehme, Illinois-Indiana Sea Grant).*

Some pharmacies will take back unused medications, but very few provide consistent information to consumers. With no current comprehensive guidance, and a growing awareness of this issue, some municipalities and states have started pharmaceutical collection and "take-back" programs. For example, the Chicago Police Department spearheaded several one-day Unwanted Medical Disposal Drives with drop-off sites throughout Chicagoland. Since 2004, more than three tons of old and unused medicine has been collected and incinerated in Chicago.


*The cover logo from the Illinois-Indiana Sea Grant tool kit, "Disposal of Unwanted Medicines: A Resource for Action in Your Community."*

Illinois-Indiana Sea Grant, with funding from the U.S. EPA Great Lakes National Program Office, has developed a tool kit entitled Disposal of Unwanted Medicines: A Resource for Action in Your Community for communities thinking about starting a take-back program or creating other disposal programs. The toolkit includes an introduction to the environmental issues associated with unwanted medicine disposal, a collection of case studies documenting successful programs initiated by communities in the United States and also in Canada, Europe, and Australia to address unwanted medicines, and sample outreach materials that communities can use to educate the public about the issue.

"We are distributing tool kits to a wide audience of local decision makers, in other words, we are educating the educators," said Susan Boehme, IISG, contaminated sediment specialist. "Our goal is for permanent collection programs to be in place and to have that reflected in measurable decreases in

pharmaceuticals in local waterways," said Boehme. "Ultimately, we would like to see more responsible distribution, purchasing, and advertising of medications to decrease the amount of unwanted medication and dollars wasted." The toolkit is available online at www.iisgcp.org/unwantedmeds. For more information, contact Elizabeth Hinchey Malloy, 312-886-3451, hinchey.elizabeth@epa.gov.

1. Kolpin, D.W. et al. 2002. "Pharmaceuticals, hormones, & other organic wastewater contaminants in U.S. streams, 1999-2000: A national reconnaissance." Environmental Science & Technology 36(6): 1202-1211.

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## DISCARDED MEDICINES—WHAT'S NEXT?

There has been a lot of interest and activity in what to do with old medicines in Wisconsin and the Midwest. Below are some highlights:

- A new Pharmaceutical Waste working group has been formed to assess current issues while formulating a long-term strategy for Wisconsin. This group has focused on three main areas, including outreach and education, pilot program development, and data collection. The working group meets on a quarterly basis. Contact Steve Brachman (414-227-3160) at the Solid and Hazardous Waste Education Center (SHWEC) for more info.
- SHWEC has developed a listing of the 2007 Medicine Collection days in its Web site. If you are planning to host an event or need to find one in your area, please check out the Web site at www.shwec.uwm.edu for more information.
- The WI Department of Agriculture Trade and Consumer Protection, which administers the state's pesticide and household hazardous waste programs, is slated to assume responsibility for helping to fund pharmaceutical waste collection programs pending final approval of the State budget. An emergency rule will need to be developed in order to get a program up and running, so stay tuned.
- State and local government pollution prevention experts recommended the formation of a Midwest Product Stewardship Council at a March meeting in Chicago. Patterned upon the Northwest PSC, one of the top items on this emerging group's agenda will be pharmaceutical waste. The next meeting of this group was held in Madison in conjunction with the Multistate Working Group June 2007conference. A follow-up survey of state representatives to the MPSC showed that pharmaceuticals were in the top two of products that the council should address.

Unfortunately, in the rush to establish safe consumer collection and disposal alternatives, public education and product stewardship issues seem to be taking a back seat. However, with old medicines potentially creating problems in water pollution; long-term exposure for aquatic life and possibly humans; poisoning; identity theft; and diversion to other users, product stewardship is integral to overall program design. Here's why:

- Manufacturers understand best the characteristics of these medicine wastes;
- Program costs can be more easily absorbed by industry as a customer service, rather than by local governments or consumers; and
- Data collection can reduce waste by identifying problem materials.

A closer look at a recent collection event illustrates the need for product stewardship. On May 1 through 3, 2007 the counties of Calumet, Outagamie, Waupaca, and Winnebago collaborated to hold five medication collection events in the greater Fox Cities area. There were 590 households that participated at the program sites, and 1,252 pounds of prescription medications and over-the-counter products were delivered and disposed through Veolia Environmental Services. Law enforcement personnel took possession of controlled substances including 23,940 pills and additional liquids.

Program participant surveys indicate that nearly three-fourths of participants had stored the medications for over two years. Nearly half the medications (46%) were brought in because they had expired. 38% of participants had flushed their medications prior to the collection event, while another 27% put them in the trash.


The collection program was made possible through a tremendous partnership among public, nonprofit, and private organizations, including local and county solid waste, water conservation, public health, human services, sheriff, police, and UW Extension offices, pharmacists from Morton Pharmacy and WalMart, Aging and Disability

Resource Centers, Senior Centers, groundwater organizations, and a marketing company. Each program was staffed primarily by volunteers at an average of 50 volunteer staff hours per site. A preliminary total staffing estimate indicates the five events utilized about 250 hours of on-site staff time, and another 500 hours to plan and market the events.

On-site volunteers documented the type and number of each medication and product brought in, which explains the high number of hours spent on the program. This was done with the intent of building Wisconsin's used medication database to begin to understand what medications end up as "leftovers," and what might potentially be done to change the current pharmaceutical distribution system.

Program partners and those who participated agreed this four-county pilot program was very successful. But, is this type of program sustainable in the long run? The amount of pharmaceuticals and over-the-counter products collected represent just a small portion of the leftovers in people's homes. A truly sustainable pharmaceutical management system will ultimately need to be more convenient for participants, with manufacturers more involved with disposal costs and management.

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## Coming Soon...Fall 2007 Edition

The LINK fall 2007 article solicitation will be sent to GLRPPR members via e-mail on or about September 4; articles will be due September 28. Send article ideas or questions to Wayne Duke at wduke@wmrc.uiuc.edu.

## RSS FEEDS AVAILABLE FOR GLRPPR SECTOR RESOURCES

The Great Lakes Regional Pollution Prevention Roundtable (GLRPPR) is pleased to announce that RSS feeds are now available for all of the online GLRPPR Sector Resources. This means that you can now subscribe to the sector and subject categories that interest you and receive updates in your news aggregator (e.g. Google Reader, Bloglines, etc.) when something new is added to those categories on the Web site. Many of you already use the GLRPPR News RSS feed, but if you're new to the concept and need more explanation, check out P2RIC's RSS Frequently Asked Questions page. The Sector Resource RSS feeds will allow you to keep up with the latest information added to the GLRPPR Web site related to your subjects of interest without having to visit the GLRPPR site, search through the Sector Resources, and try to figure out what has been added since you last checked. The "new additions" you'll be monitoring will include resources, upcoming events, funding opportunities, and archived Help Desk questions and answers related to a sector or subject.

To subscribe to Sector Resource RSS feeds, visit the Sector Resources section of the GLRPPR site. Browse through the list of categories, and click on those of interest to you. Within each Sector Resource, you'll see a small orange box next to the title of the Sector Resource. If you want to subscribe to the RSS feed for that Sector Resource, just click on that orange icon. If you're using Internet Explorer as your Web browser, you'll see a page showing the code for the RSS feed. Use the URL for that page to subscribe to the feed with your news aggregator of choice. If you're using Firefox as your Web browser, you'll go to a page that allows you to select the news aggregator you want to subscribe with. Once that choice is made, click on the "subscribe now" button and then follow the regular procedure for adding a new feed to your aggregator. For an example, see the Mercury Sector Resource and click on the orange icon at the top of the page, next to the title. The updates you'll get in your news aggregator will include the title of the new item and an indication of what the item is (e.g. "Resource," "Training," "Funding Opportunity," etc.), as well as the description of that item as it appears on the GLRPPR Web site. Click on the links in your news aggregator to visit those items on the GLRPPR site.

If you experience any technical problems related to the feeds, e-mail Tyler Rubach, GLRPPR Webmaster.

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## NEW P2 SEARCH TOOL AVAILABLE ON GLRPPR WEB SITE

The Great Lakes Regional Pollution Prevention Roundtable (GLRPPR) is pleased to announce the new "P2 Search" function available on the GLRPPR Web site. Powered by Google, this search box allows you to search 37 Web sites simultaneously for pollution prevention (P2) and related information. These sites include the U.S. EPA Web site, each of the Pollution Prevention Resource Exchange (P2Rx) Center Web sites, all of the national compliance assistance centers, the Department of Energy (Energy Efficiency and Renewable Energy as well as the Office of Science and Technical Information), P2 Gems, the Canadian Centre for Pollution Prevention (C2P2), Environment Canada's Canadian Pollution

Prevention Information Clearinghouse (CPPIC), UNEP, Europa (European Union portal), and Australia's environmental portal.

Note that when you type in a search phrase, the results page will feature links at the top allowing you to refine your search by limiting your search to the compliance assistance centers, energy efficiency-related sites, international sites, the P2Rx centers or to U.S. federal government sites.

Also, please be aware of the fact that unlike a standard Google search results page, the results page for this specialized Google search will not tell you the total number of results at the top of the page (e.g. "Results 1-XX of YYYY for your search phrase."). Ten results are shown per page. Scroll to the bottom of the results page to advance to subsequent results pages and to get a feel for the total amount of information your search retrieved.

If you have questions, comments, or suggestions for sites to add to the search, contact GLRPPR Help Desk Librarian Laura Barnes at lbarnes@wmrc.uiuc.edu.

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## GRANTS GROW MNTAP'S ENERGY EXPERIENCE

Thanks to grant funding, the Minnesota Technical Assistance Program (MnTAP) has been able to expand its energy expertise. The program recently completed work on the following two 18-month projects.

**Compressed Air**. MnTAP engaged high energy-using companies in Minnesota across three sectors—metal casting, mining, and pulp and paper. Fifty-two people from 12 different companies participated in two U.S. Department of Energy Compressed Air Challenge Best Practices trainings. Seven collaborative-targeted assessments were performed at high energy-using facilities in the three sectors following the training sessions. As a result of this grant, over nine million kWh (31,200 MMBtu) per year of energy savings was identified with potential cost savings of $448,000 per year.

Benchmarking these companies gives a sense that air compressor energy use is small compared to production energy use, even though the absolute amount of energy used by air compressors in these facilities is large. We suspect that while the auxiliary systems at high energy-using facilities are large when compared to other manufacturing sectors, they are small relative to the main production responsibilities of the high energy-using facility. Compressed air costs compared with process motors or melt technology energy needs might be seen as insignificant.

**Sector Air Compressor Economic Benchmarking**

| Sector | Estimated Annual Total Electric Cost ($) | Annual Compressor Electric Cost ($) | Annual Product Value(M $) | Compressor Energy Cost as % of Total Electric Cost | Compressor Energy Cost as % of Annual Product Value |
|---|---|---|---|---|---|
| Metal Casting | $982,000 | $158,000 | $24.5 | 18.00 | 0.636 |
| Mining | $38,544,000 | $287,000 | $438 | 0.74 | 0.066 |
| Pulp and Paper | $24,745,000 | $492,000 | $255 | 1.99 | 0.193 |

Note: all cost and value figures are estimates and have been averaged by sector.

Energy Efficiency and Pollution Prevention for Minnesota's Energy Intensive Industries was supported by funds from the Minnesota Department of Commerce.

**Metal Casting**. MnTAP used the Accelerated Diffusion of Pollution Prevention Technologies (ADOP2T) model to assist metal casters. Over 100 Minnesota metal casters received energy efficiency and pollution prevention information, six received assistance. Of these six facilities, one reduced energy use by 641 MMBtu, and eliminated 38.5 tons of carbon dioxide and 0.02 tons of priority pollutant emissions, saving over $4,400.

A foundry focus group identified these technologies as opportunities to reduce energy use: pre-heating combustion air (heat exchanger); compressed air improvements including centrifugal air compressors, compressed air storage and variable speed drives; computer simulation software; stack melting (preheat charge); and alternative alloys. *Consolidating Energy Efficiency (E2) with Pollution Prevention (P2) for Minnesota's Industrial Facilities* was supported by funds from U.S. EPA Region V.

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## POLLUTION PREVENTION SUPPORT FOR MULTIMEDIA INSPECTIONS IN HEALTH CARE

Over 18 months, Minnesota Pollution Control Agency (MPCA) staff conducted 39 multimedia inspections of hospitals in Greater Minnesota then provided Catherine Zimmer, MnTAP health care specialist, with inspection information to facilitate follow up with pollution prevention assistance. The results of this project indicate multimedia inspections coupled with pollution prevention support minimizes staff time for inspection and improves environmental outcomes. Almost 15 percent of the facilities were able to implement pollution prevention changes during the time of this grant. Those facilities reduced 4,850 pounds of waste plus 7,638 grams of mercury, to save $72,800. *Pollution Prevention Support for Multimedia Inspections* was supported by funds from U.S. EPA.

MnTAP grant reports can be found online at http://mntap.umn.edu/resources/reports.htm.

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## Upcoming Events

**National Energy Conference of Educators, July 15 - 19**

**Building, Managing & Financing a Green Project for Architects and Developers, July 21**

**2007 NGWA Ground Water and Environmental Law Conference, July 24 - 25**

**2007 ACEEE Summer Study on Energy Efficiency in Industry, July 24 - 27**

**Building Operator Certification, July 25**

**17th Annual Professional Recyclers of PA Conference, July 31 - Aug. 2**

**Green City Summer Institute - A Field Study in Chicago, Aug. 1 - 3**

**PA: IPM Discussion at Still Pond Nursery, Aug. 8**

**SolFest XII, Aug. 18 - 19**

**2007 Clean Water Partnership Summit, Sept. 5 - 6**

For more information on these upcoming events visit http://www.glrppr.org/calendar/

## CALL FOR 2006 DATA FOR P2 RESULTS DATA SYSTEM

The National Pollution Prevention Roundtable (NPPR) is requesting that agencies and programs submit 2006 P2 results data to the appropriate Pollution Prevention Resource Exchange (P2Rx) center (GLRPPR for organizations in U.S. EPA Region 5) for input into the national P2 Results Data System. Collection of data for the 2006 calendar year began on June 15, 2007.

In addition to each P2Rx center using the data to generate a regional report for calendar year 2006, NPPR will utilize this data to help prepare a three-year national report on P2 results that covers 2004-2006. Any data submitted after the September 1, 2007 deadline will be included in the data system, but may not be included in the next national report.

The Region 5 Module for the P2 Results Data System is available on the GLRPPR Web site, along with an overview of the national measurement initiative. The P2 Results Data System Fact Sheet also provides a brief introduction to the data system. If you are located in U.S. EPA Region 5 and would like to enter data into the system, contact Tyler Rubach (ph.: 217-244-6553) to obtain an account and password and/or to determine if someone from your organization is already entering data into the system. Questions regarding the Region 5 module can also be addressed to Joy Scrogum (ph.: 217-333-8948). For more information on the national P2 results measurement initiative, contact Ken Grimm of the Pacific Northwest Pollution Prevention Resource Center (ph.: 206-352-2050).

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## INDIANA PARTNERS FOR POLLUTION PREVENTION TO HOST 10TH ANNUAL CONFERENCE & TRADE SHOW

Mark your calendars for the 10th Annual Pollution Prevention Conference and Trade Show sponsored by the Indiana Partners for Pollution Prevention. This year's conference will be held on Monday, September 17, 2007 at the Ceasars Indiana Conference Center in Elizabeth, Indiana.

The Partners for Pollution Prevention (Partners) is a group of organizations including manufacturers, not for profits, institutions, and government agencies invested in promoting pollution prevention efforts in Indiana. The Indiana Department of Environmental Management (IDEM) created the Partners in 1996 to assist industries in sharing pollution prevention experiences and to advise IDEM on pollution prevention policies and programs. The 47 organizations that are currently members of the Partners have shown a proven interest in promoting and developing pollution prevention

programs to achieve measurable reductions in pollution in Indiana.

The theme for this year's conference is "P2 is a Winner Every Time" and the focus will be on pollution prevention technologies and success stories. The keynote speaker is Al Goodman, Principle, Camp Dresser & McKee, who will address "Why We Strive for Pollution Prevention: The Status of the Global Water Environment." Sam George, Vice President of Environmental Compliance, American Commercial Lines Inc., is the plenary speaker and will present on "Implementing Change as the New Guy in an Old Company." Attendees will also learn more about:

- Lighting Efficiency Technologies and Techniques
- Overview of Solar, Photovoltaic, and Wind Technologies
- Lean Manufacturing and P2
- Phytoremediation to Remove PCBs and Metals
- Wastewater Reuse
- Archaea: Wastewater's Missing Link
- Easy P2 Everyone Can Do & Know Your Results Too!
- Ozone Technologies
- Reusing Cooling Tower Water

An afternoon track will be dedicated to promoting IDEM's Environmental Stewardship Program (ESP). ESP is a voluntary program designed to achieve environmental quality objectives through partnerships with Indiana sources. Sessions specifically dedicated to ESP will include:

- Setting Environmental Objectives
- The Value of Regulatory Flexibility
- ESP Program Feedback Forum

The conference is honored to host the Governor's Awards for Environmental Excellence presentations this year. These awards are open to all Indiana facilities, state and local units of government, individuals, and technical assistance organizations that operate or support environmental protection efforts of outstanding quality. Awards presented at the conference may include Energy/Renewable Resources, Pollution Prevention, and 5 Years' Continuous Improvement.

For registration and additional conference information log on to www.in.gov/idem/prevention/partners/conference/ or contact Cara Cyrus at 812-273-6000 or by e-mail at cara.cyrus@madchem.com.

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## WASTE TO PROFIT COLLABORATION OPPORTUNITIES IN OHIO

On April 12th, an exploratory meeting was held at The Scotts Miracle-Gro Company in Marysville to explore the business benefits of waste to profit (W2P) and/or by-product synergy (BPS) networks, and how they might be established in Ohio and neighboring states. The meeting was organized by the OSU Center for Resilience. Participants included American Electric Power, Alcoa, Anheuser-Busch, Battelle Memorial Institute, Dow Chemical, Honda of America Manufacturing, Cardinal Health, Marathon Petroleum, Owens Corning, Solid Waste Authority of Central Ohio, Ohio and U.S. EPA. Also participating was the U.S. Business Council for Sustainable Development, a pioneer in the practice of BPS.

The World Business Council for Sustainable Development and the U.S. EPA has defined BPS as 'the synergy among diverse industries, agriculture, and communities resulting in profitable conversion of by-products and wastes to resources promoting sustainability.'

BPS is the principle that underpins the concept of "industrial ecology"—a holistic view of industry in which organizations exchange energy and material between one another, rather than operating as isolated units. Industrial ecology promotes a shift away from traditional open linear systems towards closed loops and interdependent relationships of the kind found in nature. For more information, please visit the U.S. Business Council for Sustainable Development at www.usbcsd.org/ or the Partnership for Industrial Ecology in Central Ohio (PIECO) at http://swaco.org/PIECO.aspx.

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## WILBUR WRIGHT COLLEGE UPGRADES ELECTRICAL AND WATER SYSTEMS

On June 26 the photovoltaic system at Wilbur Wright College, located in Chicago, was fully installed and began making electricity. Two days later, on June 28, the solar water heating system was also completed and operating.

Systems' specifications include:

- the photovoltaic (pv) system consisting of 10 x 180 watt panels mounted on the southernmost facade of the parking structure at Wright. The parking structure has some 700 lighting fixtures over its 7 floors, but the system was wired into the electrical panel that feeds the power supply of the 24 / 7 / 365 security lighting, a smaller portion of the total number of fixtures, in order to maximize the system's efficiency. Under optimal sunlight conditions, (for example, about this time of year, in the early afternoon) the PV system can generate up to 1.8 kilowatts of power. And the system continues to provide a curve of power as long as there is available sunlight for it to use (i.e., from early morning through sunset).

  In just its first 24 hours of operation, this small but efficient array had provided nearly 8 kW hours of energy. That will result in a direct reduction of the campus electrical bill, and on an annualized basis, would reduce greenhouse gas emissions (assuming the energy saved was produced by coal-fired power plants) by approximately 2 tons.

- the solar water heating system consists of 6 collector panels mounted on the roof of the Science Building on campus. These panels are hung from the southwest-facing wall of the mechanical penthouse, and a heat exchanger and hot water storage tank are located inside the penthouse. The system draws in cold potable water, and delivers heated water back to the school's domestic hot water lines. It is capable of making up to 400 gallons of hot water per day, and providing that amount upon demand (e.g., when showers, the cafeteria, or other users began drawing hot water for use).

  Under optimal conditions, this system could result in an estimated 6 tons of carbon dioxide reductions in comparison to the amount of natural gas combustion required to heat 400 gallons of hot water per day on an annualized basis.

The complete renewables project also calls for the collection of wind velocity and directional data (for the potential future siting of a wind turbine on campus).

For further information on this project, contact David Inman, Project Manager, Building Energy Technologies Curriculum, 773-481-8477.

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## SUSTAINABLE BUILDING'S DOORS NOW OPEN ON PA NATIONAL LANDMARK

As Pennsylvania's only "seashore," Presque Isle on Lake Erie offers visitors a beautiful coastline and many recreational activities, as well as is a favorite spot for migrating birds. Because of the many unique habitats, Presque Isle contains a greater number of Pennsylvania's endangered and rare species.

The new Tom Ridge Environmental Center (TREC), the gateway to Presque Isle, is an educational center dedicated to teaching visitors about the isle and its inhabitants. It also serves as a center for research, contributing to conservation efforts and promoting environmental awareness.

The architect and landscape designer wanted to create a cohesiveness between building and nature. Sited to minimize the disturbance of a nearby bluff, the building opens its long dimension to the sun. Distinguishing between the solar exposure characteristics of the north and south sides of the building, the fenestration and shading character of each side are differently expressed. The building capitalizes on northern light through the clerestory windows, while on the south, large expanses of curtain wall composed of transparent and translucent panels, modulated by the exterior shading devices, embrace the light of the sun. Operable clerestory windows help to naturally ventilate the windows. Inverted roof forms supported on grids of tree-like steel columns, collect rainwater for reuse in toilet flushing, thus significantly reducing overall water consumption. Steel is used throughout the building along with many other materials with high recycled-content. The landscape includes steps to protect existing natural amenities, avoid the need for irrigation, and employ native plants to reinforce the local ecology. The building is designed to achieve a LEED Silver rating from the U.S. Green Building Council.

For more information on Presque Isle State Park and the Tom Ridge Environmental Center go to www.dcnr.state.pa.us/stateparks/parks/presqueisle.aspx.

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## FINE PRINT

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**Bob Iverson, GLRPPR Executive Director,** One Hazelwood Dr., Champaign, IL 61820, 217-333-8940, 217-333-8944 (fax), biverson@wmrc.uiuc.edu.

**Wayne Duke, LINK Designer & Editor,** One Hazelwood Dr., Champaign, IL 61820, 217-333-8940, 217-333-8944 (fax), wduke@wmrc.uiuc.edu.